B. Project Description

B.1 Introduction

This section describes the Concord to Sacramento Pipeline Project proposed by SFPP, L.P.[1] (SFPP). The information is intended to provide a common understanding of the project parameters as they are analyzed in Section D, where environmental impacts are evaluated. Aspects of the project that are specific to particular issue areas (such as Air Quality or Transportation issue areas) are presented in those issue areas.

SFPP's Project Objectives

The California Environmental Quality Act (CEQA) Guidelines (Section 15126.6.a) require that alternatives to the Proposed Project must feasibly attain most of the basic objectives of the project. Therefore, in order to explain the need for the Proposed Project, and to guide in development and evaluation of alternatives, SFPP was asked to define its project objectives. SFPP identified the following four objectives for the Concord to Sacramento Pipeline Project:

- Increase the ability of a common-carrier pipeline system to transport refined petroleum products from refineries and other sources in the San Francisco Bay Area to commercial and military markets in central California and northern Nevada.
- Minimize the need for tanker truck transportation of petroleum products from the Bay Area to markets in central California and northern Nevada.
- Minimize the number of jurisdictions affected by the project.
- Supply product to the Sacramento Airport via a future tie-in to the new pipeline by Wickland Oil Company.

It is also noted that SFPP intends to discontinue use of most of its existing 14-inch petroleum products pipeline between Concord and Sacramento from shipping petroleum products when the new pipeline becomes operational. Because this decommissioning is a part of the Proposed Project, it is considered by the CSLC to be a project objective. The decommissioning of the existing 14-inch pipeline will become a condition of the CSLC lease for the Proposed Project.

Organization of Section B

Section B.2 describes SFPP's current pipeline operations. Section B.3 describes the proposed Concord to Sacramento Pipeline project (also called the Proposed Project), with additional details in Section B.4 (Construction), Section B.5 (Operation and Maintenance), and Section B.6 (Useful Life of Proposed Pipeline).

B.2 SFPP's Current Operation

Kinder Morgan Energy Partners, L.P. (KMP) is a publicly traded limited partnership and is the largest independent refined petroleum products system in the United States in terms of volume delivered. KMP's Pacific operations consist of interstate common carrier pipelines regulated by the Federal Energy Regulatory Commission, intrastate pipelines in California regulated by the California State Fire Marshal, and certain non rate-regulated operations. SFPP, L.P., CALNEV Pipeline, LLC, and West Coast Terminals comprise KMP's Pacific operations in seven western states. SFPP is headquartered in Orange, California, and currently employs 575 people, with 442 in California and 140 of those in Orange and 71 in Northern California. The

[1] SFPP is an operating partnership of Kinder Morgan Energy Partners, L.P. (KMP).

Pacific operations' pipelines are split into a South Region and a North Region. Combined, the two regions consist of seven pipeline segments that serve six western states with approximately 3,900 miles of refined petroleum products pipeline and related terminal facilities.

KMP's Pacific operations transport over one million barrels per day of refined petroleum products, providing pipeline service to approximately 15 company-owned truck loading terminals, 44 customer-owned terminals, four commercial airports, and 15 military bases. Currently the Pacific operations serves in excess of 80 shippers in the refined products market, with the largest customers consisting of major petroleum companies; independent refiners; the United States Military; and independent marketers and distributors of products. Average breakdown of the three main product types transported are gasoline (60%), diesel fuel (30%), and jet fuel (10%).

The North Region consists of three pipeline segments: the North Line, the Bakersfield Line, and the Oregon Line. The Concord to Sacramento pipeline evaluated in this EIR is part of the North Line. The products delivered through the North Line originate in refineries in the San Francisco Bay Area and the North Line also receives product transported from various pipeline and marine terminals that deliver products from foreign and domestic ports. The North Line consists of approximately 1,075 miles of pipeline in five segments originating in Richmond and Concord, California. The five segments of the North Line are as follows:

- **Richmond/Concord–Fallon Segment.** The Richmond/Concord–Fallon segment of the North Line is approximately 492 miles long. This segment originates in Richmond, continues to Concord, and extends through Reno, Nevada, to Fallon Naval Air Station (NAS) with intermediate storage and delivery points in Sacramento, Rocklin, and Roseville. Within this segment, a pipeline extends from Concord to Travis Air Force Base (AFB) and another pipeline extends from Rocklin to Chico with takeoff to Beale AFB.
- **Richmond/Concord–Bradshaw Segment.** This segment, which is approximately 213 miles long, begins in Richmond/Concord and continues to Bradshaw, California. There are intermediate storage and delivery points at Mather Airport, McClellan AFB, and Stockton, California.
- **Richmond/Concord–Fresno Segment.** This segment is approximately 193 miles long and begins in Richmond, extends east to Concord, and then continues to Fresno.
- **Richmond/Concord–San Jose Segment.** This segment, which is approximately 72 miles long, begins in Richmond/Concord and ends at a storage and delivery terminal in San Jose.
- **Richmond-Brisbane Segment.** The Richmond-Brisbane section of the North Line consists of approximately 88 miles of pipeline. From its origination in Richmond, this segment extends to Brisbane with an intermediate storage and delivery point at the Oakland Airport. From Brisbane the line extends to a storage and delivery point at the San Francisco International Airport.

Within the Richmond/Concord–Fallon segment of the North Line, the Proposed Project would replace the existing 14-inch pipeline that extends from SFPP's Concord Station to SFPP's Sacramento Station.

Product currently flowing through the existing SFPP Concord to Sacramento pipeline generally has the following distribution based on total volume:

- 28% to the Sacramento area.
- 40% to the Roseville/Chico areas.
- 32% to the Reno area.

This distribution is expected to generally remain the same, but may vary over time depending on the market. The volume of product delivered will increase as the market grows.

B.3 Proposed Project

B.3.1 Description of the Proposed Pipeline

SFPP is proposing to construct and operate a new petroleum pipeline from the existing SFPP Concord Station in Contra Costa County to the existing SFPP Sacramento Station in the City of West Sacramento, California (see Figure B-1). The pipeline system will include 68.4 miles of new 20-inch pipe, 0.4 miles of new 14-inch pipe, 1.1 miles of SFPP's existing 14-inch pipe (beneath the Carquinez Strait), and 0.8 miles of new 12-inch pipe.

The current capacity of the existing system is 152,000 BPD with a current peak demand of 137,000 BPD. With a forecasted annual increase in demand of 2.5%, the existing capacity would be reached in 2006. To respond to this demand, the proposed new pipeline would carry gasoline, diesel fuel, and jet fuel, and would have a capacity of 200,000 BPD. The new 20-inch pipeline would be designed to operate at a maximum pressure of 1,440 pounds per square inch (psi).

The purpose of the new pipeline is to meet projected demand for petroleum products (including fuel for military installations) in the Sacramento, Roseville, Chico, and Reno areas by replacing most of SFPP's existing 36-year old, 14-inch pipeline between Concord and Sacramento. The existing pipeline is approximately 60 miles long and is located primarily within Union Pacific Railroad (UPRR) right-of-way (ROW). Upon completion of the Proposed Project, most of the existing pipeline would be decommissioned from further use in petroleum product service by SFPP (see Section B.3.4). However, approximately 6,000 feet of the existing 14-inch line would continue to be used for the crossing of the Carquinez Strait until such time that 20-inch pipe can be installed using a single horizontal directional drill (HDD). The 20-inch pipeline with 6,000 feet of 14-inch pipe beneath the Carquinez Strait would operate at a maximum of 1,350 psi. The Proposed Project also includes construction of 0.8 miles of new 12-inch pipe to connect with a proposed Wickland jet fuel pipeline serving the Sacramento International Airport (described in Section B.3.1.6 below).

Upon project approval, the CSLC will issue a 25-year lease to SFPP for construction and operation of the Proposed Project. The project has an expected life of 50 years. The proposed CSLC lease terms would require that the project must be decommissioned (cleaned and no longer used for product shipment) or removed when the lease expires, unless the lease term is extended. As noted in Section B.3.2, the existing pipeline crossing of the Carquinez Strait has a useful life of 12 years. The CSLC lease will require that this portion of the Proposed Project be decommissioned and replaced within 12 years of project approval. Table B-1 summarizes the components of the proposed pipeline.

B.3.1.1 Proposed Pipeline Route and Locations of Project Features

General Route Description

Figure B-1 presents an overview of the Proposed Project route. The pipeline route would begin at the SFPP Concord Station just outside of the City of Concord in Contra Costa County and travel northwest through industrial areas of the county and the City of Martinez (note that a more detailed route description follows Table B-1 below). It would connect to the existing 14-inch pipeline to cross the Carquinez Strait from approximately Milepost (MP) 5.1 to 6.4. The pipeline route in the city of Benicia would travel northeasterly in industrial areas largely in road ROWs. The pipeline route would leave the city of Benicia between MPs 8 and 9 and travel primarily through agricultural areas of Solano County.

Table B-1. Summary of Project Components

Component / Location	Description
	Pipeline Components
Pipeline	• 70.7 miles long (including the 4,100-foot Wickland Connection) • 68.4 miles of new 20-inch diameter pipe • 0.4 miles of new 14-inch pipe • 1.1 miles of existing 14-inch pipeline across the Carquinez Strait • 0.8 miles of 12-inch pipe (Wickland Connection) • Pipe Coating: Pritec 10/40 (or similar polyethylene type product) • Pipe: high grade, high-strength carbon steel • Pipe wall thickness: 0.375" • Pipe thickness at major water crossings: 0.500"
Throughput	• Normal maximum flow rate (in gasoline): 8,400 barrels per hour (BPH) • Normal average flow rate: 7,300 BPH • Design maximum flow rate (in gasoline): 9,550 BPH • Design average flow rate: 8,333 BPH • Design flow rate based on system design capacity of 200,000 barrels per day (BPD) average
Products Shipped (approximate breakdown)	• Unleaded gasoline: 60% • Jet fuel: 10% • Diesel fuel: 30% • Percentages are based on current demand and may shift over time depending on the future market demand
Operating Parameters	• Maximum Allowable Operating Pressure (MAOP): 1,350 psig • Product temperature (ambient): 72°F
Safety/Operating System	• 5 motor operated block valves (MOVs, (including MOVs at pig launcher/receiver's at each end of pipeline) • 7 manual valves • Computerized pipeline monitoring system (SCADA System)
	Station Modifications
Concord Station	All modifications would be within existing station boundaries. Modifications would include: • Existing tank suction piping upgrades • New surge and existing shipping pump system upgrades • New pig launcher • New product meter and prover • Existing electrical instrumentation and control system upgrades
Sacramento Station	All modifications would be within existing station boundaries. Modifications would include: • New pig receiver • New meter (installation of dedicated leak detection meter) • Existing electrical instrumentation and control system upgrades

At approximately MP 19 the pipeline route would cross a portion of marshland and the Cordelia Slough. It would then enter the City of Fairfield and travel approximately one mile in an unincorporated industrial and agricultural area before entering Suisun City. In Suisun City the pipeline route traverses a residential area for less than a mile. The route would then travel through an industrial area in Fairfield near MPs 28 and 29. From MP 30 to MP 50 the pipeline route would travel through mostly agricultural lands in Solano County. Approximately 0.7 miles later, the pipeline would enter an unincorporated area of Yolo County and travel through an agricultural area. Near MP 65 the pipeline would enter the City of West Sacramento and travel largely in road ROWs through industrial areas until ending at the existing SFPP Sacramento Station at MP 70.

Figure B-1. Overview of Proposed Pipeline Route

Wickland Connection

In addition to the proposed 20-inch pipeline between Concord and West Sacramento, a new 12-inch diameter pipeline branch would be constructed to serve Wickland Oil Company (Wickland) so that Wickland can supply fuel (primarily jet fuel) to the Sacramento International Airport (SIA) via a proposed new pipeline that was approved by the County of Sacramento on May 1, 2002. The SIA Jet Fuel Pipeline and Tank Farm Project is proposed to be constructed in 2003.[2] The construction of Wickland's SIA pipeline and tank farm is a separate project that will connect to SFPP's existing 14-inch pipeline.

The 12-inch branch proposed by SFPP is required because when the proposed 20-inch pipeline becomes operational, Wickland's planned connection to SFPP's existing 14-inch pipeline would become obsolete. Therefore, SFPP proposes to construct a 4,100 foot long 12-inch branch from the new 20-inch pipeline to Wickland's metering station as part of the Concord to Sacramento Project. The 12-inch pipeline branch would start at MP 66.4 and connect to Wickland's 12-inch SIA pipeline via its metering station at a location north of West Capitol Avenue in West Sacramento.

Detailed Description of Proposed Route

Figure B-2 (on five sheets, at the end of this section) illustrates the proposed route in detail. The route is described in the following paragraphs.

Concord Station to Carquinez Strait. The route begins where the pipeline would depart SFPP's Concord Station at 1550 Solano Way and travel west across Walnut and Grayson Creeks. It would follow a transmission corridor, crossing Burlington Northern Santa Fe Railroad (BNSFRR) and Pacheco Slough, until meeting and paralleling Central Ave in Contra Costa County. The route would continue behind a residential area in an existing pipeline corridor until turning northeast onto Arthur Road (abandoned) and then west onto Waterbird Way. From there, the pipeline would parallel Waterbird Way into Shore Terminal (ST) property.

As the proposed 20-inch pipeline continues through ST Service's property it would be adjacent to the south side of Zinc Hill until reaching the start of a proposed 1,280-foot HDD that would cross both the future and existing alignments of the Peyton Slough and take the pipeline into the Rhodia, Inc. (Rhodia) property. Once in the Rhodia property, the pipeline would turn northwesterly and continue along the west side of the existing Peyton Slough alignment (with an approximate 40- to 50-foot offset).

North of Rhodia's existing "Settling Pond," the proposed 20-inch pipeline would leave Rhodia property and enter State-owned (CSLC) property. On State-owned property the 20-inch pipeline would begin to diverge westerly, away from the existing Peyton Slough alignment, as it would continue north towards the Carquinez Strait. At a location adjacent to the existing access road through this area, a permanent above-ground pig launcher/receiver station (40- by 75-foot fenced area) would be constructed and the proposed 20-inch pipeline would reduce down to a new 14-inch pipeline. From the permanent launcher/receiver station (MP 4.8), approximately 1,460 feet of proposed new 14-inch pipeline would continue westerly, underneath the future Caltrans I-680 bridge overpass to a connection point with SFPP's existing 14-inch seamless pipeline segment originating south of the Carquinez Strait shoreline. From the connection point (MP 5.0), the existing 14-inch seamless pipeline segment would be used for the approximately 6,000-foot crossing of the Carquinez Strait.

Benicia to Cordelia. On the north shore of the Carquinez Strait, the end of the existing 14-inch pipeline segment would be connected to another new 14-inch pipeline segment (MP 6.1). The new 14-inch

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[2] It is noted that construction of the Wickland Pipeline to the Sacramento Airport may be delayed to later than 2003 due to potential delays in airline cost participation.

pipeline segment would continue north for approximately 100 feet through an open vegetated area and then easterly underneath the future Caltrans I-680 bridge overpass for approximately 450 feet until reaching a second proposed permanent above-ground launcher/receiver station (40- by 75-foot fenced area) at MP 6.3 on Benicia Industries' property. At the launcher/receiver station the proposed pipeline would transition back to 20 inches.

In the City of Benicia, the proposed route would travel through car lots, crossing Sulphur Springs Creek and UPRR tracks, before joining Industrial Way. The pipeline would follow Industrial Way across the UPRR tracks again and would turn northeast onto Park Road. Approximately one mile later, the proposed route would turn east onto Second Street. It would follow Second Street before turning east onto Lopes Road and enter unincorporated Solano County jurisdiction. After paralleling Lopes Road for approximately 6 miles, the proposed route would cross under I-680 (2,600 feet south of Ramsey Road) and parallel Ramsey Road.

Cordelia Area. At MP 17.5, just north of Smith Drive, the route would turn northeasterly and follow an existing transmission corridor through the Cordelia marsh and across the Cordelia Slough. On the east side of the slough, the proposed route would briefly enter the City of Fairfield and would parallel the UPRR right-of-way until MP 22.0 where it would intersect with and turn east adjacent to Cordelia Road. The proposed route would return to unincorporated Solano County at MP 22.9 along Cordelia Road.

Suisun City/Fairfield. At MP 24.5, the route would enter the City of Suisun City. Approximately 800 feet east of Pennsylvania Avenue, the pipeline would cross the UPRR tracks and enter the City of Suisun City for approximately 200 feet, then into private ROW in Solano County. At the intersection of Ohio and Jefferson Streets, the pipeline would turn east onto Ohio Street. In the City of Fairfield, the proposed route would turn north onto Union Avenue then east onto Broadway Street. It would cross the UPRR tracks, entering into the City of Suisun City and joining Railroad Avenue. From Railroad Avenue, the pipeline would run east along Tabor Ave then north along Walters Road, once again entering the City of Fairfield. After traveling east on Huntington Drive and north on Peabody Road, the pipeline would turn east and parallel Vanden Road into Solano County just after MP 30.7.

Rural Solano and Yolo Counties. Beginning at MP 30.7, the proposed route would follow Vanden Road until a turn to the east to join private property north of McCrory Road. From McCrory Road, the route would turn north adjacent to Meridian Road and east adjacent to Hay Road. Between MP 37.3 and MP 38.8, the pipeline would enter and be located in Hay Road. At Highway 113, the pipeline would enter private ROW and continue east parallel to an access road until intersection with an abandoned railroad ROW to the northeast. The route would follow the private and abandoned railroad ROW for approximately 9 miles until its intersection with Levee Road/Road 104 and Mace Boulevard, where the pipeline would enter Yolo County and then continue to travel to the northeast along the abandoned railroad ROW to meet a transmission corridor. The route would turn north and follow the transmission corridor until it would cross under Interstate 80 (I-80), then turn east to parallel the south side of the existing UPRR ROW, and then enter the City of West Sacramento.

West Sacramento. At MP 65.1 in the City of West Sacramento, the proposed route would continue to follow along the south side of the UPRR ROW until turning south towards West Capitol Avenue. It would travel east adjacent to West Capitol Avenue, then south under I-80 onto Enterprise Avenue. The proposed pipeline would turn east onto Industrial Boulevard, travel through lands of the Port of West Sacramento at Terminal Street, and join Port Access Road along the north side of the Sacramento River Deep Water Channel. After turning north onto South River Road, the route would enter SFPP's West Sacramento Station at MP 69.8.

SFPP's Development of the Proposed Route

As part of the process of alternatives screening and impact reduction, SFPP undertook a long-term analysis for potential environmental impact identification along the proposed route. Since the initial development of the Proposed Project, SFPP made many refinements to the route to avoid these identified resources. Table B-2 lists the 12 route modifications that SFPP incorporated into the Proposed Project. The mileposts, change in route length, and a description and rationale for each change are also included in the table.

B.3.1.2 Waterway Crossings

The proposed pipeline project would cross approximately 64 waterbodies, ranging from 25- to 50-foot creek or canal crossings to an approximately 6,000-foot crossing of the Carquinez Strait. It is anticipated that 12 of these crossings would be constructed using a horizontal directional drill (HDD) method. The remaining crossings would use a slick bore, cased bore, or open cut construction method. Table B-3 lists each waterway crossing, its location, and the type of construction tentatively proposed for its crossing (the crossing type as to whether it is HDD or slick bore may be modified in final design).

Five of the waterways are under CSLC jurisdiction because the State has sovereign ownership of all tidelands and submerged lands and beds of navigable waterways. The State holds these lands for the benefit of all the people of the State for statewide Public Trust purposes, which include waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. In non-tidal navigable waterways, the State holds a fee ownership in the bed of the waterway between the two ordinary low water marks. The area of the bed of a non-tidal navigable waterway between the ordinary low and high water marks is subject to a Public Trust Easement. The five CSLC jurisdictional waterways that would be crossed are the following:

- **Walnut Creek.** Walnut Creek is approximately located at MP 0.3 and would be crossed with horizontal directional drilling (HDD).
- **Grayson Creek.** Grayson Creek is located just west of Walnut Creek at approximately MP 0.3 and would be crossed using HDD.
- **Pacheco Creek.** Pacheco Creek is approximately located at MP 1.6 and would be crossed with open cut trenching.
- **Carquinez Strait.** The proposed pipeline would connect to the existing 14-inch pipeline to cross the Carquinez Strait from approximately MP 5.1 to 6.4. As it becomes necessary and feasible, Phase 2 of the project would be constructed in which at approximately between MPs 4.5 and 6, a new 6,925-foot directional drill would be completed.
- **Cordelia Slough.** The Cordelia Slough is located at approximately MP 19.2 and would require HDD.

B.3.1.3 Valves and Valve Locations

SFPP's general approach to valve spacing is to install one valve approximately every one to ten miles, except in sensitive areas where spacing was reduced. Valves are also placed to work with topography to control flow in an accident. Twelve block valves and one check valve are currently proposed to be installed as part of the project. Figure B-3 shows the ground profile of the proposed route. Table B-4 lists the proposed valves and the type of valve proposed at each location.

Figure B-4 shows a diagram of a typical mainline block valve. Figure B-5 shows photographs of a typical valve site during and after construction. Two types of valves would be used along the proposed pipeline route between the Concord and Sacramento Stations:

Table B-2. SFPP's Reroutes of the Proposed Project

Length of Reroute (feet)	Original Route Lengths (feet)	Change in Route Footage (feet)	Description/Reason for Reroute	Comments
12,144	10,828 (MP 4.07-MP 6.12)	+1,320	The alignment in the area of the Carquinez Strait has been modified to facilitate reuse of a 6,000-foot portion of SFPP's existing 14" pipeline that currently crosses the Strait. Balance of the reroute would be a new pipe on either side of the Strait that ties the existing pipeline back to the originally proposed route.	The proposed reroute would eliminate a new pipeline crossing of the Carquinez Strait. During Phase 2 of this project, SFPP plans to pursue a single HDD crossing to replace the 14" pipe once HDD technology is proven to be capable of completing a +/- 7,000-foot drill.
1,460	1,460 (MP 15.17-MP 15.43)	0	This is a revised crossing alignment of I-680. Elevation difference of over 50 feet from the west to the east side of I-680 would make construction infeasible at the originally proposed location. The reroute reduces the elevation change to less than 20 feet.	The proposed reroute would result in a more favorable alignment relative to historical landslide contours identified in this area by URS Corporation's Geohazard Study. One new water crossing would result from this reroute.
3,375	4,260 (MP 18.30-MP 19.10)	-885	The reroute is a revised alignment west of Cordelia Slough. Landowner concerns with the proposed route dictated this reroute.	The reroute follows an alignment through more pastureland and reduces the impact on undisturbed marshland. One new water crossing would result from this reroute.
1,912	1,764 (MP 21.67-MP 22.01)	+148	This is a revised alignment near Chadbourne Road, which was required to avoid a Federally owned land parcel on the south side of the existing UPRR ROW.	One new water crossing would result from this reroute.
15,780	17,342 (MP 29.97-MP 33.25)	-1,562	This is a revised alignment along Vanden Road. It was developed to avoid a future residential development west of Peabody Road, to accommodate landowner objections, and to avoid construction impacts on endangered vernal pool habitat east of Vanden Road.	Locations of two proposed water crossings would be modified as a result.
1,531	1,373 (MP 19.69-MP 19.95)	+158	This is a revised alignment east of Cordelia Slough to avoid construction impacts on the endangered plant species, Contra Costa Goldfields	The goal of this reroute is to maintain a minimum clearance of 150 feet between the sensitive area and the construction work zone.
1,426	1,320 (MP 20.25-MP 20.50)	+106	This is a revised alignment near Thomasson Lane to avoid construction impacts on the endangered, Elderberry, plant species.	The goal of this reroute is to maintain a minimum clearance of 150 feet between the sensitive area and the construction work zone. One water crossing is relocated.
4,013	3,960 (MP 22.86-MP 23.61)	+53	This is a revised alignment south of Cordelia Road, near Ledgewood Creek to avoid construction impacts on the endangered plant species, Contra Costa Goldfields	The goal of this reroute is to maintain a minimum clearance of 150 feet between the sensitive area and the construction work zone. Three water crossings would be relocated.
67,690	66,634 (MP 42.15-MP 54.77)	+1,056	This revised alignment is along the old Sacramento RR ROW and was developed to avoid construction impacts on endangered vernal pool habitat and culturally historical RR berm and to improve the construction workspace.	The goal of the reroute in the area of existing vernal pools is to maintain a natural hydrological barrier (i.e., existing water canal or elevated berm) or a 250-foot buffer between pipeline construction and vernal pool habitat to eliminate potential impacts. Seven new water crossing would be added, ten relocated, and one eliminated with this reroute.
950	158 (MP 65.51-MP 65.54)	+792	This revised alignment is north of I-80 near West Capitol Avenue. It was developed to bring the pipeline to a suitable location for an above-ground meter station to accommodate the Wickland Connection tie-in.	The goal of this reroute is to facilitate the 4,100-foot branch connection from the proposed 20" pipeline to an approved 12" pipeline that will transport SFPP transported product to the Sacramento Airport (see also last row below).
1,637	2,587 (MP 6.81-MP 7.30)	-950	This revised alignment is within Benicia Industries property north of the Carquinez Strait and was developed based on landowner objections.	The goal of the reroute is to minimize construction impacts on Benicia Industries daily operations. As only preliminary discussions with the landowner have taken place to this point, there is the potential for additional future changes.
4,100	0	+4,100	The proposed alignment of the 12" Wickland Connection is not a reroute, but additional scope to the Proposed Project.	Wickland expects to have a pipeline connection to SFPP's existing 14" pipeline by 2004. The proposed Wickland Connection as part of this project would reestablish a connection to the SFPP system once the existing 14" pipeline is taken out of service.

NOTES:

Total length of reroute identifies the actual footage along the newly proposed route and represents the footage that would be added to the project. Total length of original route identifies the actual footage along the route initially submitted to CSLC and represents the footage that would be removed from the project.

With the summarized reroutes shown above, the originally proposed route length of 69.84 miles is now 70.66 miles (including the 4,100-foot Wickland connection). Net change in route footage after reroutes is 4,336 feet.

Table B-3. Water Crossings Along Proposed Pipeline Route

Crossing Number	Description	Begin Milepost	Crossing Length: HDD	Crossing Length: Bore	Crossing Length: Open Cut
1	Walnut/Grayson Creek	0.3	1,125	--	--
2	Pacheco Creek	1.6	--	--	150
3	Peyton Slough (future align)	4.0	1,280	--	--
4	Carquinez Strait	4.8	--	--	--
5	Sulphur Springs Creek	6.8	800	--	--
6	Stream/Railroad	7.4	--	60	--
7	Stream/drainage outfall	9.1	--	--	25
8	Stream	9.8	--	--	25
9	Stream	10.6	--	--	25
10	Stream/drainage outfall	12.1	--	--	25
11	Stream	13.8	--	--	25
12	Stream	13.9	--	--	25
13	Stream	14.2	--	--	25
14	Stream	15.2	--	--	25
15	Stream	15.5	--	--	25
16	Stream	15.9	--	--	25
17	Stream	16.5	--	50	--
18	Stream	17.1	--	--	25
19	Stream	17.5	--	100	--
20	Stream	18.4	--	100	--
21	Cordelia Slough	19.2	800	--	--
22	Stream	19.5	--	200	--
23	Stream	20.3	--	--	25
24	Suisun Creek	20.5	--	250	--
25	Drainage ditch	21.7	--	50	--
26	Stream/drainage ditch	22.9	--	--	25
27	Ledgewood Creek	23.3	800	--	--
28	Stream	23.6	--	--	25
29	Peytonia Slough	23.7	--	100	--
30	Stream/railroad	24.8	--	320	--
31	Laurel Creek	26.1	--	60	--
32	Flood control culvert	26.3	--	200	--
33	Stream/Drainage Outfall	27.9	--	--	50
34	Stream	32.0	--	50	--
35	Irrigation canal	32.7	--	40	--
36	Irrigation canal	33.8	--	40	--
37	Stream	35.2	--	80	--
38	Irrigation canal	36.7	--	40	--
39	Irrigation canal	38.8	--	40	--
40	Ulatis Creek	40.7	800	--	--
41	Maine Prairie Creek	41.9	--	100	--
42	Irrigation canal	42.2	--	80	--
43	Hass Slough	42.8	1,000	--	--
44	Irrigation canal	43.7	--	80	--
45	Stream	44.8	--	120	--
46	Stream/drainage ditch	45.3	--	120	--
47	Stream	45.8	--	100	--
48	Irrigation canal	46.5	--	50	--
49	Irrigation canal	46.6	--	50	--
50	Irrigation canal	48.2	--	50	--
51	Irrigation canal	48.2	--	50	--
52	Stream/drainage ditch	50.3	--	80	--
53	Stream	51.0	--	80	--
54	Stream	51.2	--	100	--
55	Stream	52.7	--	80	--
56	Stream	53.3	--	150	--
57	Stream	53.9	--	80	--
58	Stream	54.1	--	100	--
59	Putah Creek	57.8	800	--	--
60	Canal	59.7	800	--	--
61	Canal	60.5	--	100	--
62	West Yolo Bypass	62.0	800	--	--
63	East Yolo Bypass	65.2	800	--	--
64	Washington Lake	65.8	800	--	--
	Footage Totals		10,605	3,350	550

Table B-4. Valves Along Proposed Pipeline Route

Valve No.	Location (MP)	Valve Type	Location	Jurisdiction
1	0.00	MOV	SFPP Concord Station, 20” Launcher	Contra Costa County
2	4.75	MOV	State Land adjacent to Rhodia Plant, 20”x14” Launcher/Receiver Station (south of Carquinez)	City of Martinez
3	6.30	MOV	Benicia Industries, 14”x20” Launcher/Receiver Station (north of Carquinez)	City of Benicia
4	15.15	Manual	Private, west of Lopes (@ I-680 crossing)	Solano County
5	20.10	Check	Private, east of kennel & west of train tunnel	Solano County
6	24.75	MOV	Private, at Broadway west of UPRR	City of Fairfield
7	34.75	Manual	Private, southwest of Meridian and Hay	Solano County
8	44.60	Manual	Private, near Binghamton	Solano County
9	54.40	Manual	Private, near Road 106	Yolo County
10	61.90	Manual	Private, west of Willow Slough	Yolo County
11	65.50	MOV	Private, east of Toe Drain	City of West Sacramento
12	69.30	Manual	Private, south end of S. River Rd.	City of West Sacramento
13	69.84	MOV	SFPP Sacramento Station, 20” Receiver	City of West Sacramento

Two types of valves would be used along the proposed pipeline route between the Concord and Sacramento Stations (see Figure B-4 for a diagram of a typical mainline valve).

- **Block valves** operate such that when closed, the valve would block product flow in both directions. All block valves are proposed to be WKM Powerseal gate valves, with Rotork as the proposed motor operator supplier. All MOV locations are subject to change depending on available power access.
- **Check valves** operate to prevent the flow of product in the reverse direction from its shipment; they are designed to be held open by flowing product and to drop down and close automatically when product flow stops or is reversed.

Three general types of block valves can be used on a pipeline:

- **Motor Operated Valves** (MOVs) (6 of the 12 block valves proposed by SFPP) can be closed by an operator in SFPP’s pipeline control center in southern California when data is received from the pipeline monitoring system that indicates that a potential leak or spill has occurred. Closure of these valves can be implemented after (a) the monitoring system or the operator identifies a problem, (b) the operator evaluates and verifies the data received, and (c) the operator shuts down pumps and then the valves.
- **Manual Valves** (6 of the 12 block valves proposed by SFPP) can be closed only when a SFPP employee drives to the valve location and physically closes the valve. The size of a pipeline spill that occurred adjacent to a manually valved pipe segment would depend on the time required to reach the valve location. The proposed pipeline has only manual valves along a 40-mile stretch of pipeline (between MOVs at approximately MP 25 and 65).
- **Automatic Valves** (SFPP has not proposed any of these valves) can be designed to close automatically, without operator involvement, when a specific event occurs. These valves can be programmed to close in the event of the pipeline losing pressure (as it would if a rupture occurred), if an earthquake of a certain size occurred, or even if a certain amount of rain fell.

B.3.2 Carquinez Strait Crossing: Phase 1 and Phase 2

When the Concord to Sacramento Pipeline Project was originally proposed to the CSLC, it required installation of a new 20-inch diameter pipeline beneath the Carquinez Strait using a single 6,800-foot HDD. After SFPP's research and consultation with five HDD contractors, SFPP determined that the drill may be feasible now; however, the contractors identified several risks associated with an HDD of this length. In addition, a 6,800-foot HDD and corresponding pull of 20-inch diameter pipe has never before been completed.

To minimize the risk associated with the worst-case construction scenario of not being able to complete the HDD in a single drill, SFPP considered a combination HDD and open-cut construction method with approximately 1,000 to 1,500 feet of open-cut construction in the water on the north side of the Strait. Although this method is feasible, it would add considerable complexity to construction, add expense to

Figure B-3. Ground Profile of the Proposed Pipeline Route

Figure B-4. Typical Mainline Valve for Gear Operator

Figure B-5. Typical Valve Site During and After Construction

the project, result in restrictive limitations on the construction window, and result in additional environmental impacts within the Strait and the marsh on the south side of the Strait. As a result, SFPP has proposed a two-phase approach to the Carquinez Strait crossing. Figure B-6 illustrates the locations of the two phases.

Phase 1 Carquinez Strait Crossing

SFPP proposes to use its existing 14-inch pipeline as the means of crossing the Carquinez Strait until such time as single HDD is proven feasible (the HDD would be completed in Phase 2; see below). SFPP has evaluated the type and pressure rating of the existing pipe, its integrity, pipeline hydraulics, and potential impacts to the proposed upgrades at Concord Station. The 6,000-foot portion of the 14-inch existing pipeline across the Carquinez Strait is 0.375-inch wall thickness, seamless, grade B pipe and is rated for a maximum operating pressure of 1,350 psig. Recent internal "smart" pig inspection, evaluation of the cathodic protection, and underwater visual inspection have indicated that there are no integrity issues with this portion of the existing pipeline. In addition, system hydraulics would be minimally impacted and projected flow rates for this project could be maintained without modification to the proposed scope of upgrades to Concord Station. The use of the 14-inch pipe would require an increase in pump discharge pressure coming out of Concord Station to 1,130 psig; however, this increased discharge pressure is within the capacity of the originally proposed pump upgrades and would be well below the design pressure limitation (1,350 psig) of the existing 14-inch pipeline segment. The use of the existing 14-inch pipeline would not affect the 200,000 BPD throughput because during the time period in which this pipeline segment would be used, demand for product is not expected to reach the 200,000 BPD level. The use of the existing 14-inch pipeline segment would also not affect the normal or design flow rates (stated in Table B-1), because it would be such a short segment of the overall pipeline.

To accommodate the use of the existing pipeline, at a location on State-owned (Caltrans) land on the south side of the Carquinez Strait, a permanent above-ground pig launcher/receiver station is proposed to facilitate the transition of the 20-inch pipeline to a 14-inch pipeline and to allow for future internal inspections of both sections of the pipeline. The pig launcher/receiver station would be contained within an approximately 40-foot by 75-foot fenced area and would include necessary above-ground piping and valving to allow for both normal and "smart" pig inspections. The entire area would be curbed for containment.

From the pig launcher/receiver station, approximately 1,460 feet of new 14-inch pipeline would be constructed to connect to the existing 14-inch pipeline, which would be used for the approximately 6,000-foot crossing of the Carquinez Strait. On the north shore of the Carquinez Strait, the existing 14-inch pipeline would be connected to another new 14-inch pipeline segment, which would then continue for approximately 450 feet to a second proposed permanent above-ground pig launcher/receiver station. This station would the same size or slightly larger but with the same configuration as the one proposed on Rhodia property. It would be located at the point where the pipeline would transition back to the new 20-inch pipe.

Within Rhodia property (MP 4.1-5.0), pipeline construction, access, and workspace would need to be coordinated with the Rhodia-managed Peyton Slough remediation effort that is scheduled to be underway at approximately the same time. However, with the proposed HDD (Water Crossing No. 3) underneath the slough alignments and the routing of the trenched portion of the pipeline offset from the existing Peyton Slough, the proposed pipeline alignment would be outside the limits of the remediation work area itself. As a result, both SFPP and Rhodia believe that both projects can proceed independently without impact to one another.

Rhodia's remediation plan includes a relocation of Peyton Slough itself. The timing of SFPP's HDD beneath the new and old Peyton Slough channels may occur independent of Rhodia's project activities, except that the precise location of and access to the drill pit on Rhodia property would need to be coordinated to avoid conflicts with Rhodia's project staging and laydown activities. Pipeline trenching along the west side of the existing Peyton Slough would need to occur either before or after Rhodia work to remove dredge spoils and cap the existing slough. SFPP and Rhodia have agreed to coordinate construction of their respective projects to avoid potential conflicts.

Phase 2 Carquinez Strait Crossing

SFPP plans to modify this pipeline project in the future to include a new 20-inch pipeline that would be installed by directional drilling across the Carquinez Strait. This would occur in approximately 10 to 12 years for the following reasons:

- In 10 to 12 years, SFPP estimates that the capacity of the proposed system will be reached, so they would not be able to ship the increased product that is expected to be demanded in the region.
- The CSLC’s petroleum structures engineer has determined that the existing pipeline could safely be used for up to 12 more years (to 2015).
- The technology for horizontal directional drilling currently does not allow certainty for a single 6,000 foot drill. As HDD technology is enhanced, SFPP will propose this technology to install the new 20-inch pipe underneath the Carquinez Strait using a single HDD. A separate and subsequent CEQA analysis would be prepared in the future to analyze the potential environmental impacts of a new pipeline crossing of the Carquinez Strait.

Figure B-6 illustrates the location of the Phase 2 crossing. The Phase 2 route would diverge from the proposed route at MP 4.7, turning northeast for about 650 feet and crossing the current location of Peyton Slough. At this point the route would turn to the northwest, heading straight across the Strait. One-tenth of a mile south of the shoreline, a 200 by 200-foot work area would be located to allow for the placement of directional drilling equipment. In addition to the pipeline construction itself, space must be allowed on the south shore of the Strait for the layout of a 50-foot wide 6,200-foot long temporary laydown area for the pipe string that would be pulled across the Strait.

A 200 by 200-foot work area would also be required about 300 feet north of the north shore of the Strait. At this location, the Phase 2 20-inch pipeline would rejoin the Phase 1 20-inch pipeline, at current MP 6.3.

Before the Phase 2 crossing is implemented, the major remediation effort currently underway at the Rhodia site (from approximately MP 4.1 to 5.0) would result in the relocation of Peyton Slough. The new location of Peyton Slough will be about 500 feet east of the location of the Phase 2 pipeline and work area. Therefore, the Phase 2 construction would not cross the slough itself.

This EIR evaluates Phase 2 of the Carquinez crossing only in general terms. A separate CEQA document will be completed to address impacts of the crossing at the time it is proposed and detailed engineering plans are available.

B.3.3 Proposed Terminal Modifications

Upgrades to SFPP’s existing Concord and Sacramento Stations would be required to connect and operate the new pipeline. These upgrades would occur within the existing facility boundaries and would include the installation of piping, fittings, valves, and other equipment that would be necessary to connect the new pipeline to the existing facilities. The same SFPP specifications, codes and regulations that dictate material purchase, construction, inspection, testing, and maintenance for the pipeline would apply to upgrade work within the stations.

Figure B-6. Carquinez Strait Crossing (Phase 1 and Phase 2)

B.3.3.1 Concord Station

Within the Concord Station, product is gathered in storage tanks from refineries in the area or from other SFPP stations and then transported by pipeline to Sacramento. Upgrades to the Concord Station would include tank suction piping, surge system and surge pumps, modifications to existing shipping pumps, new pig launcher, and a new meter and prover.[3] Modifications to existing electrical instrumentation and controls would be required to facilitate the increased pipeline size and to maintain leak detection. The modifications to the substation are listed below:

Suction/Surge System. A new surge system would be installed to accommodate the increased line capacity. The new surge system would consist of the following:

- New 36-inch surge header, located on the west side of the existing manifold area.
- Replace approximately 200 feet of 14-inch pipe with 20-inch pipe on each of the tank suction lines.
- New surge pump/1200 horsepower (hp) motor and surge tank.
- 20-inch twin-seal valves, with hydraulic operators, on the tank drop lines.
- 36-inch twin-seal valves, with hydraulic operators, on the surge header.
- Automatic vents to vapor recovery for the new surge tank and at the ends of the surge headers.
- New hydraulic power system to operate the new hydraulic operated valves. A line connecting the new and existing systems would be installed in order to allow the systems to back each other up.
- The existing surge system would be left in place and modified in order to allow tank-to-tank transfers and serve as a backup for the Proposed Project or other pipelines in the system as necessary.

Pump System. The existing impellers in the shipping pumps would be replaced to accommodate the increased flow rate and take advantage of available motor horsepower.

Metering System. A new metering system would be installed including a new turbine meter, new meter run, and new prover. The metering system would be designed to provide custody transfer quality metering.

Pressure Control Valve. The existing pressure control valve is adequate for the increased rate and no modifications are required.

Pig Launcher. A new 20-inch diameter pig launcher would be installed with motor operated valves and set up similar to the existing launcher.

Control System. A dedicated programmable logic controller (PLC) would be installed for the Concord to Sacramento pipeline.

Electrical System. The existing plant electrical system has no room for expansion in the existing electrical building. In order to accommodate the new surge pump, the following modifications would be required to the electrical system:

- If needed, a new electrical building, 40 feet x 25 feet, (located next to the existing building) with lighting, receptacles; grounding; heating, ventilating, and air conditioning (HVAC), etc.
- Medium voltage starter for 1200 HP motor, with bus extension from existing switchgear building.
- Installation of power and control conduits and cables from the power house to various equipment and the PLC in the control room.
- 480 Volts Alternating Current (VAC) power (including conduits and cables) would be installed to the new prover, hydraulic unit, and motor operated valves.

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[3] A prover is a device that verifies the volume of product that passes through a pipeline.

B.3.3.2 Sacramento Station

Upgrades at the Sacramento Station would include a new pig receiver, a new product meter for leak detection, and modifications to existing electrical instrumentation and controls.

A new 20-inch diameter pig receiver would be installed with motor operated valves and set up similar to the existing receiver. In addition, a two- or three-beam ultrasonic meter would be installed to measure full pipeline flow. The meter would be installed upstream of the location where product is removed from the system for local (Sacramento) distribution to provide a flowrate measure that can be used for leak detection monitoring. Since flow would be stripped at Sacramento and limited to 7,400 BPH or less, no changes are required to the existing metering or proving system.

The existing 8-inch Dantrol control valve would be reused and would continue to be used to control flow and pressure into the station. However, new motor operated valves would be installed to accommodate flow to either the station or to the booster pump. The new valves would replace the existing valves in function and are only larger in size. A new basket strainer would be installed on the suction line to the booster pump to replace the existing strainer to facilitate tie-in. The electrical system would have to be upgraded as well, so 480 VAC power (including conduits and cables) would be installed to the new motor operated valves.

B.3.4 Decommissioning of the Existing 14-Inch Pipeline

After construction of the new 20-inch pipeline is complete, with the exception of the portion across the Carquinez Strait, the existing 14-inch pipeline would be decommissioned (taken out of service). Petroleum in the portion of the existing 14-inch pipeline that would no longer be used would be displaced using nitrogen into storage tanks at SFPP delivery points. Once the pipeline is evacuated and purged of petroleum product, the tie-in points at Concord and Sacramento Station and on either side of the Carquinez Strait would be disconnected and sealed off. The purged, sealed pipeline would be shut in and left with positive nitrogen pressure to eliminate the potential of future internal corrosion. In addition, the decommissioning of the existing Elmira Booster Pump Station would consist of draining the station piping, blinding the tie-in piping from the 14-inch line, and removing major equipment.

Before a pipeline can be reclassified by the California State Fire Marshal (CSFM) from “active” to “out-of-service,” a written plan describing the process to be used and future maintenance and inspections to be performed must be submitted to and approved by the CSFM. After this process has been verified and accepted in writing by CSFM, the out-of-service pipeline must comply with minimum federal maintenance and inspection requirements, which consist of maintaining cathodic protection, right-of-way patrols, and Underground Service Alert notifications.

Pigging of the pipeline using “smart” pigs is not required. SFPP would maintain the pipeline in out-of-service status in accordance with CSFM requirements until a decision regarding final use of the pipeline is made. SFPP's Master Lease No. 5439.1 with the California State Lands Commission has expired and is currently in negotiation for new terms and conditions, including, but not limited to, pipeline maintenance requirements.

The decommissioning procedure is estimated to be complete within 60 days after construction of the new 20-inch pipeline is complete. The decommissioned pipeline could possibly be used for other purposes such as a wastewater conveyance, a conduit for underground electrical utilities, cable television, fiber-optic lines, telephone or data circuits, or other suitable service. However, any such use would require amendment of the CSLC lease and a new CEQA analysis.

B.4 Pipeline Construction

B.4.1 Construction Schedule, Planning, and Labor Force

The proposed construction would commence in March 2004 and would require approximately eight months to complete. Approximately 270 personnel would be employed on the project during the peak construction period. Approximately 60 percent of the workforce would be skilled labor, and 40 percent would be unskilled labor.

Construction of the Proposed Project currently anticipates the use of eight separate construction "spreads" (a spread is a separate construction work area with separate personnel). All of these spreads could be working concurrently at different locations, and would proceed at an average of 200 to 500 lineal feet per day.

- One mainline spread (cross country work, approximately 125 people).
- One street work spread (roadway work, approximately 75 people).
- Two special crossing spreads (primarily for slick or cased bores underneath waterways, railroads, and highways, approximately 6 people each spread).
- Three spreads for directional drilling (major waterway crossings, approximately 12 people each spread).
- One station work spread (station work, approximately 20 people).

Table B-5 defines construction spreads, personnel required, and the time required for each type of operation.

Table B-5. Construction Spreads and Personnel

Spread Type (Number)	Description of Work	Personnel	Timing	Percent of Route
Mainline spread (1)	Cross country	125 people	8 months (full duration of construction)	75%
Street work spread (1)	Roadway	75 people	8 months	20%
Hammer bore crew (1)	Water, railroad and highway crossings	6 people	6 months (first 6 months of construction)	1%
Auger bore crew (1)	Water, railroad, and highway crossings	6 people	6 months (first 6 months of construction)	1%
Horizontal directional drilling crew (3 crews)	Major water crossings	12 people (each crew)	4 months (first 4 months of construction; all 3 simultaneous)	3%
Station work crew (1 crew)	Station upgrades	20 people	4 months	N/A

B.4.2 Equipment and Material

B.4.2.1 Staging Areas

During pipeline construction, SFPP's contractor would establish approximately four temporary yard locations for staging and storage of miscellaneous construction materials and equipment. Minimum space requirements for each yard location would be approximately two to three acres. Yard locations would require temporary power and telephone service so that a field office trailer can be set up and equipped.

Ideally, the four yard locations will be evenly spaced along the proposed 70.7-mile pipeline route and provide good access to the route through use of public roads. With this in mind, initial search locations for the four yards would be focused on the Concord/Martinez, Fairfield, Dixon, and West Sacramento areas. All yard locations would be within a 10-mile radius of an existing city limit (see Figure B-7 for yard locations). Each morning, all craft crews would report to the yard prior to being transported to the job site in contractor-provided vehicles or in construction vehicles and equipment.

Figure B-7. Map of Temporary Yard Locations for Staging and Storage

The location selected for a yard will be disturbed areas or improved lots with power and access. Ultimately, the location of the temporary yards will depend on where space is available and whether the temporary use of the space can be negotiated with the landowner. Specific sites cannot be realistically located at this time because those that are currently available may be unavailable in 2004 when they are needed. An in-depth search for temporary yard locations will not take place until construction planning begins (after project approval in Fall 2003). Figure B-8 depicts a schematic of a typical temporary yard for staging and storage.

Wherever possible, construction material would be stored at the existing facilities of the contractors and suppliers providing equipment, supplies, or labor to the project. Additional staging areas may be required but will typically be an empty warehouse, parking area, agricultural area or developed area.

The major material component of the project would be pipe. In general, the pipe would be stored at a vendor's coating yard, the existing SFPP stations, or existing storage/rail yards until it is delivered and unloaded at points along the route. Aggregate, asphalt, sand, and slurry materials would be purchased locally, and storage would be provided by local suppliers.

During all phases of construction, refueling and lubrication of construction equipment would occur at the contractors' staging yards or along the construction right-of-way. Equipment would be regularly checked for leakage.

B.4.2.2 Construction Sites

Most of the heavy construction equipment would be delivered to the initial point of the spread on lowboy trucks or trailers. Mobile cranes and dump trucks would be driven in from local contractors' yards. Construction equipment would be left overnight at the site as feasible, at the contractor yards, or at other storage yards in the area. All equipment would be lubricated, refueled, and repaired by the contractor or local servicing companies.

All construction materials would be taken to the construction spreads by truck on existing roadways. For pipe delivery by truck, it is assumed that each truck would carry 40- to 80-foot lengths of pipe. Materials that would be truck transported to the site would include: the coated pipe sections (40 to 80 feet), pipe fittings, valve assemblies, and shoring pile; coating supplies (for weld-joints); welding materials; cement, aggregate, gravel, sand, and slurry (from local plants) for backfill at street crossings; asphalt for re-paving; signs and fencing; fuel and lubrication for equipment; drinking water; and water for dust control. Alternatively, water may be available from fire hydrants or permitted water sources in the project area for hydrotesting and dust control. The amounts of each material needed would depend on the location and activity of the spread at any given time.

B.4.2.3 Waste Management

Generally, waste generation from construction would be in the form of short sections of line pipe, wastes from X-raying, welding, and coating as well as boxes and crates used in the shipment of materials. These materials would be sorted by metal or non-metal and typically would be hauled to local waste disposal centers. Trash containers would be provided at each yard for daily refuse from construction workers. Other construction wastes would include contaminated soil that cannot be returned to the trench as backfill; rubble from trenching paved areas; and water used to hydrostatically test[4] the pipeline. The non-hazardous

[4] A hydrostatic test involves filling a test section of the pipeline with fresh water and increasing pressure to a pre-determined level. This pressure level would be at least 1.25 times the pipeline maximum operating pressure or up to 90 percent of the specified minimum yield strength (SMYS) of the pipe. Such tests are designed to prove that the pipe, fittings, and weld sections would maintain mechanical integrity without failure or leakage under pressure.

Figure B-8. Schematic of Typical Temporary Yard for Staging and Storage

wastes would be hauled to a sanitary landfill; the used hydrostatic test water would be treated as required and discharged under permit, and hazardous wastes would be sent to a permitted treatment or disposal facility. Construction crews would use portable chemical toilets.

Construction and operation of the proposed pipeline would not create gaseous waste. Liquid waste would be disposed of in an approved disposal facility. Solid waste would be transported to and disposed at a local landfill.

B.4.3 Utility and Services Requirements

Construction equipment would require both gasoline and diesel fuel. All construction equipment would be fitted with appropriate mufflers and all engines would be maintained regularly. Welding machines would use diesel or unleaded fuel.

Water would be used as necessary to control fugitive dust and to wash streets as a supplement to sweeping streets. In addition to the daily construction water needs, hydrostatic testing of the pipeline would also require water. Hydrotest water would be obtained from local water districts. The estimated volume of water to be required to test the proposed 20-inch pipeline would be approximately 5.4 million gallons (total line fill). Although the total line fill volume is provided, the pipeline would likely be hydrostatically tested in segments, using a fraction of that volume.

Each construction spread working along the proposed pipeline route would require onsite diesel fuel generators for the temporary supply of electricity. Together the mainline spread and street work spread would have approximately 15 pickup-mounted welding machines, each with its own generator. In addition, utility generators would also be used for the intermittent operation of dewatering pumps, hydraulic equipment, grinders, sandblasters, temporary lights, etc.

B.4.4 Pipeline Construction Methods within ROW

A pipeline construction spread would be composed of several units. The units would be organized to proceed with the work in the order listed below. Each activity type is generally described in the following sections and depicted in Figure B-9.

- Pre-construction activity
- ROW clearing (cross country construction only)
- Trenching
- Hauling and stringing the line pipe
- Pipe bending, lineup, and welding
- Weld inspection
- Applying protective coating to the weld joints
- Lowering and tying in
- Backfilling
- Hydrostatic testing
- Construction in roadways and urban areas
- Cross-country construction

Pre-Construction Activity/Startup. Once the proposed pipeline project is approved and a specific alignment is defined, a construction plan would be developed that, among other things, would identify specific sites for fuel storage required for construction. In general, fuel storage sites would be located to provide adequate setbacks from existing waterbodies (approximately 100-foot minimum) and water wells (approximately 200-foot minimum). Each fuel storage site would be contained within earthen berms lined with plastic. Refueling of construction equipment would take place along the right-of-way using absorbent material to create temporary berms around the equipment. Absorbent pads of various sizes and shapes (called "pigs" and "socks") would be used to contain and absorb over-pumps as well as for emergency containment during transport delivery and are discussed in Section B.5.3, System Inspection and Maintenance.

Figure B-9. Typical Pipeline Construction

Prior to construction, SFPP's contractor would develop an emergency response plan, spill prevention plan, or similar document. As part of this plan, SFPP's contractor would be required to have available adequate spill containment and cleanup resources on site at all times. The contractor would be prepared to contain, control, clean up, and dispose of any potential fuel spill quickly and completely.

ROW Clearing (Cross-Country Construction only). A 100-foot-wide ROW would typically be used for rural construction. Vegetation would be cleared and the construction ROW graded to provide for safe and efficient operation of construction equipment, and to provide space for temporary storage of spoil material and salvaged topsoil. In general, the width of the ROW clearings would be kept to a practical minimum to avoid undue disturbance of adjacent resources. Brush clearing would be limited to trimming and/or crushing in those areas specified by the jurisdictional agency to avoid disturbance of root systems. Where tree clearing is necessary, the ROW boundaries would be flagged and any specimen trees on the perimeter would be preserved from damage.

All brush and other materials that are cleared would be windrowed along the ROW. Where necessary, all brush and other debris cleared would be disposed of in accordance with instructions from the jurisdictional agency or landowner, and all applicable laws and regulations. In areas of public view, cleared materials would be removed and disposed of by the completion of pipeline construction and cleanup activities. The ROW would then be graded and restored to nearly pre-construction grades.

As required by Mitigation Measure LU-2a in Section D.9, topsoil removed during the clearing and grading operations would be segregated from subsoils. At a minimum, the first 6 inches of surface soil would typically be separated. These topsoils would be preserved for subsequent restoration activities on the ROW.

SFPP's ROW agents would coordinate with property owners and tenants to assure minimum impact upon farming operations. Owners and/or tenants would also be contacted and asked to review the final clean up on their property. All damages to crops, not previously negotiated, would be paid. SFPP's ROW agents would accompany contractor's agent during all negotiations for off-ROW damages.

Grading of the construction area would be performed in order to create a suitable work surface for construction vehicles and heavy equipment. On flat terrain, the work surface would be leveled across the entire ROW. A bi-level work surface may be necessary in sloped areas, for example, west of Lopes Road. Sidehill cuts would only be made where necessary to create a safe, stable surface for heavy equipment use. Sidehill cuts would be kept to a minimum to minimize environmental effects.

Portions of the pipeline construction would be in wet soil conditions. In most cases the pipeline equipment would be able to operate under normal conditions. In some situations the equipment would have to be worked off of timber mats as needed for safety. These mats are generally made of 12-inch by 12-inch by 20-foot lumber that is lashed together. This keeps the equipment from sinking into the wet soil. Another option would be to place a petromat type of fabric on the wet soil and then place dry soil or gravel on top of the fabric. This would act as a roadway for the equipment to travel on. Excavations in the wet soil condition are generally performed with an excavator type of backhoe. After the construction is complete, the area would be cleaned up and returned as close as possible to its original condition.

Fences crossing the ROW would be braced, cut, and temporarily fitted with gates to permit passage. During construction, the opening would be controlled as necessary to prevent the escape of livestock. Existing fences would be replaced and braces kept in place upon completion of construction activities. During construction, no gates or cattleguards on established roads over public lands would be obstructed or damaged by construction activities. Where the pipeline crosses cultivated land, access would be provided as required for property owners or tenants to move livestock and equipment across the excavated ditch. Adequate precautions would be taken to ensure that livestock and wildlife would not be prevented from reaching water sources due to construction obstacles. Such precautions would include contacting livestock operators, providing adequate crossing facilities, or other measures as needed.

All survey monuments located within the ROW would be protected during construction activities. Survey monuments include, but are not limited to, General Land Office Cadastral survey corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil survey monuments. In the event of obliteration or disturbance of any of the above, the incident would be reported. Where General Land Office monuments or references are obliterated during construction, the services of a registered land surveyor or a Cadastral surveyor would be employed by SFPP to restore the monuments in accordance with established procedures. Each such survey would be recorded with the appropriate county and other jurisdictional agencies.

Trenching. Typically a six-foot-deep trench would be excavated, and the total work area would be up to 100 feet wide. A typical trench would be 36 inches wide. The trench would be excavated using backhoes, ditching machines and track hoes. An exception to the mechanical excavation would be hand-digging using air tools to locate buried utilities, such as other pipelines, cables, water mains and sewers. No blasting is anticipated.

Fugitive dust emissions at the construction site during earthmoving operations would be controlled as needed by water trucks equipped with spray nozzles.

Spoils from cuts, including cuts in streets, would typically be used as backfill materials at the site of origin. Materials unsuitable for backfill use and economically not usable for other purposes would be disposed of in accordance with local and county guidelines in available landfills.

It is possible that contaminated soil would be excavated during construction, especially in older industrial areas with shallow groundwater. Contaminated soil would be used as backfill with agency approval. Contaminated soil that cannot be returned as backfill would be disposed or treated at an appropriate permitted facility.

Hauling and Stringing the Line Pipe. Pipe-stringing trucks would be used to transport the pipe in 40- to 80-foot lengths from the shipment point or storage yards to the pipeline ROW. Where sufficient room exists, trucks would carry the line pipe along the ROW, and sideboom tractors would unload the joints of pipe from the stringing trucks and lay them end to end beside the ditch line for future lineup and welding.

Pipe Bending, Lineup, and Welding. As required, coated line pipe would be bent in the field by a portable bending machine to fit the contour of the ditch both vertically and horizontally. Construction ROW conditions could sometimes require that prefabricated "shop" bends be used when field bending would not be practical. Welding the pipe would involve use of lineup clamps that would hold the pipe sections in position until 50 percent of the first welding pass was completed. Following the lineup crew, the welding crew would apply the remaining weld passes to bring the thickness of the weld to more than the thickness of the pipe by approximately 1/16-inch or as required by DOT. All pipeline welds would be radiographically[5] inspected.

Weld Inspection. All field welding would be performed by qualified welders in accordance with SFPP specifications including API 1104 (Standard for Welding Pipe Lines and Related Facilities) and the rules and regulations of the U.S. Department of Transportation (DOT) found in the Code of Federal

5 **Radiographic Inspection** is the use of high energy radiation to study the condition of welds and pipeline structure. Gamma rays from absorbed materials and X-rays from vacuum tubes are the types of energy sources used for this technique. The energy wave pass through the metal undergoing irradiation and some of the energy is absorbed in that process. The amount of absorption is dependent upon the density and thickness of the metal. The differences in the absorption are measured by exposure to photographic film or electronic devices.

Regulations (CFR) Title 49 (Part 195 for liquid pipelines). As a safety precaution, a minimum of one 20-pound dry chemical unit fire extinguisher would accompany each welding truck on the job.

One hundred percent of the welds would be radiographically inspected, exceeding the 10 percent inspection requirement found in CFR Title 49, Part 195 (49 CFR Part 195). Radiographs would be recorded and interpreted for acceptability according to requirements of API 1104. All rejected welds would be repaired or replaced as necessary and re-radiographed. The X-ray reports as well as a record indicating the location of welds would be kept for the life of the pipeline.

In addition to standard mill testing of all pipe and fittings, hydrostatic testing would be performed after construction and before startup. Federal regulations (49 CFR Part 195) mandate hydrostatic testing of new, petroleum pipelines before placing the line into operation. Such tests, as described in more detail in the Hydrostatic Testing section below, are designed to prove that the pipe, fittings, and weld sections would maintain mechanical integrity without failure or leakage under pressure.

Applying Protective Coating to Weld Joints. Pipeline coating would typically be applied at a qualified coating facility before delivery to the construction site. However, field coating (heat shrink polyethylene sleeves) would be necessary on all field weld joints made at the site in order to provide a continuous coating along the pipeline. After the pipe has been welded and radiographically inspected (X-rayed), heat shrink polyethylene sleeves would also be used or alternatively, polyken tape and tape primer could be used.

A detection test would be conducted to locate any coating discontinuities that could permit moisture to reach the pipe, such as thinning, or other mechanical damage. The testing device (a holiday detector) develops an electrical potential between the pipe and an electrode in contact with the outside of the coating or ground. Pinholes in the coating of microscopic size can be located using the holiday detector. All coated pipe, including field joints, fittings, and bends would be tested and repaired as necessary, and before backfilling.

Lowering and Tying In. The pipe would be lifted and lowered into the ditch by an appropriate number of side-boom tractors spaced so that the weight of unsupported pipe would not cause mechanical damage to the pipe. Cradles with rubber rollers or padded slings would be used so the tractors could lower the pipe without damage as they travel along the ditch line. Ditch welds could be required whenever the ditch line is obstructed by other utilities crossing the pipe ditch. These welds would usually be made in the ditch at the final elevation, and each weld would require pipe handling for lineup, cutting to exact length, and coating, and backfilling, in addition to normal welding and weld inspection.

Backfilling and Compaction. Native material excavated from the pipeline trench would be reused for trench backfilling to the maximum extent possible. In order to protect the pipe coating, the initial backfill to a depth of 12 inches above the pipe (commonly referred to as padding and shading material) would contain rock no greater than 5/8 inch in size, or the pipe would be covered with a protective padded barrier called a rock shield. For locations along the route where native material contains rock sizes greater than 5/8 inch and rock shield would not be used, the native material used for padding and shading would be processed by a standard screening device to separate out the larger material before placement in the trench. After the larger material is separated, the remaining native material would be placed in the trench above the pipe if it is acceptable for compaction.

For locations where screening of backfill is not practical or where native material is not suitable for compaction, import material would be used in the backfilling process. Import backfill material may be soil that has adequate structural integrity to allow for proper compaction, sand/decomposed granite, or base rock material as used in road construction.

The criteria for determining the quality and suitability of native and/or import material for use in trench backfilling would be dependent on compaction requirements for different sections along the route. Areas requiring higher compaction (i.e., paved roadways) would require backfill materials with higher structural integrity. Use of the proper backfill material, backfilling in lifts (approximately 12 to 18 inches at a time), use of compaction rollers and/or hydraulic tampers, and compaction testing would ensure that all trench locations are compacted in accordance with good engineering practices. In densely populated areas and other locations with unrestricted access where safety concerns are present, trenches would be fenced, backfilled, or steel plates would be used to cover any open trench left at the end of each workday.

Hydrostatic Testing. In addition to standard mill testing of all pipe and fittings, hydrostatic testing would be performed after construction and before startup. Federal regulations (49 CFR Part 195) mandate hydrostatic testing of new, petroleum pipelines before placing the line into operation.

Permanent records would be kept on each eight-hour hydrostatic test. These records would contain the exact location of the test segment, the elevation profile, a description of the facility, and continuous pressure and temperature of the line throughout the test. Deadweight testers would be used to verify the accuracy of pressure-recording devices and charts during the test, as required by 49 CFR Part 195.

Construction in Roadways and Urban Areas. Construction of the pipeline would occur in several road ROWs. Construction would require closure of at least two lanes of traffic. Approval to construct and operate a pipeline would be obtained or authorized by franchise agreements or permits from the agency with jurisdiction over the streets along the proposed route. The approval process would include specification of traffic control measures and identification of acceptable construction work hours. At some locations, night time construction may be required to minimize the impacts on area traffic. After ROW is obtained and the project is permitted, landowners, permittees, and business owners along the ROW would be notified in advance of construction activities that could affect their business or operations. Notification to landowners would be by mail and by telephone. Tenants would be notified in person a few days ahead of construction. Other notification would be made by various means, including placing signs at road crossings in advance of construction.

Emergency response providers near the proposed route would be notified in advance of exact construction locations, road closure schedules, and potential alternate routes. Schedules for necessary on-street parking closures would be published well in advance of the street closure. Directly affected businesses and residents would be given ample notice and information to plan alternatives. Signage would be provided to direct motorists to alternate routes. SFPP would work with local police and traffic engineers to plan appropriate access alternatives for temporary street closures and traffic disruptions. Traffic control requirements from municipalities would also be followed.

Where construction activities may adversely affect pedestrian access or transit stops, transit providers would be contacted to develop temporary alternatives with appropriate signage and public notification. Businesses along the pipeline route would be informed in advance of planned construction dates. Temporary signs would be installed and alternate vehicular and pedestrian access established. Existing access to businesses near the proposed route would be maintained throughout the construction period to the degree possible consistent with safe and efficient construction practices. Where such access must be temporarily disrupted, SFPP would provide advance notice and work with business operators to minimize disruptions.

SFPP or the construction contractor would notify Underground Service Alert (USA) who would notify service providers of intended construction to avoid conflict with existing utilities and disruptions of service to utility customers.

Surface preparation would include removing pavement with concrete saws and/or grinding equipment. The broken debris would be hauled off to approved landfill sites or a crusher plant via dump trucks. The restoration process for construction in roads and streets would entail removal of debris, construction signs, and surplus material and equipment, followed by re-paving.

Cross-Country Construction. In areas where cross-county construction would occur, debris would be removed and the ROW would be restored and, where appropriate, revegetated. Steps would be taken to minimize erosion, restore the natural ground contour, account for trench settling, reestablish plant growth where appropriate, and allow natural surface drainage. As agreed with the landowner or jurisdictional agency, all completed construction areas and temporary access roads would be returned as nearly as possible to their original condition and level of productivity. All restoration and revegetation would be completed as agreed to with the landowner or jurisdictional agency.

Trash, brush, surplus material, and other debris would be cleared from construction areas and disposed of in an appropriate manner. The ROW would then be graded and restored to nearly pre-construction grades.

Mitigation Measure BB-6a in Section B.4 requires that re-seeding be accomplished using an appropriate seed mix or plant species approved by the landowner or jurisdictional agency. Seedbed preparation and seeding operations would be conducted in accordance with accepted techniques for the particular area and task. On cultivated or improved lands, the ground surface would be restored to a condition as agreed to with the landowner.

Restoration and revegetation in sensitive stream and river crossings would be completed in compliance with Mitigation Measures BB-5a, BB-5b, and BB-5c site-specific revegetation/reclamation procedures. In these areas, advice would be sought from other agencies to fully determine appropriate mitigation and reclamation measures.

Owners and/or tenants would be contacted and asked to review the final clean up on their property. All damages to crops, not previously negotiated, would be paid. SFPP's ROW agents would accompany contractor's agent during all negotiations for off-ROW damages.

B.4.5 Waterway Crossing Techniques

Construction of the Proposed Project would result in crossing approximately 64 waterbodies ranging from small creeks to large channels (see Table B-2 above). The construction methods proposed for these crossings would be either a horizontal directional drill (HDD), slick bore, cased bore, or open cut. Each technique is described below.

Open Cut. The open cut technique for small drainages would require a trench to be excavated from bank-to-bank. This would require equipment such as backhoes, bulldozers, and draglines to excavate the ditch. The trench would be excavated to allow the pipe to be placed approximately 5 feet below the flow line to ensure the pipe is not exposed by streambed scour. Dewatering techniques are not proposed for these crossings as the entire length of pipeline for the crossing would be pre-welded, and the joints coated, and if necessary counterweighted before lowering the pipeline into place. The installed pipe would then be backfilled with spoils. The creek or drainage would be returned to its original configuration, substrate replaced, banks stabilized, and revegetated as necessary.

Slick and Conventional Boring. Slick and conventional boring would be conducted at some canal and flood control channel crossings. A bore pit would be excavated on each side of the waterway. These pits, approximately 25 to 30 feet long by 10 to 15 feet wide, would be excavated with a backhoe outside the natural channel. Depth of the pits would depend on final pipeline depth. Spoils from the excavation would be placed alongside the pits outside of the channel for future use as backfill. Minimum buffer zones of 15 feet for entry and exit points on either side of the stream and 5-foot vertical clearance beneath the streambed would be maintained to minimize the potential environmental impacts.

A crane would be used to lower the boring machine, casing (if required), and pipe lengths into the pit. Casing and pipe sections would be welded, inspected, and coated (pipe only) in the pit before boring. Section lengths would be limited by the length of the bore pit. The bore would be drilled approximately five feet below the scour depth of the stream channel. Any groundwater encountered during drilling would be discharged per Regional Water Quality Control Board requirements. The procedure employed would be determined during final design. Upon completion of the pipeline installation, the excavated areas would be backfilled, compacted, re-contoured, and restored to natural conditions.

For slick and cased bores, workspace requirements, as shown in Figures B-10 and B-11, on either side of the water crossing would be maintained within the proposed 100-foot-wide temporary construction right-of-way. They would require that approximately 10- to 15-foot-wide by 25- to 30-foot-long bore and receiving pits be excavated down to 2 to 3 feet below the final pipe crossing elevation on each side of the water crossing.

Horizontal Directional Drilling (HDD). HDD is a highly specialized boring technique that would be used to drill an arc that would travel under Walnut and Grayson Creeks, Cordelia Slough, and other large waterbodies. As depicted in Figures B-12 through B-15, HDD is used in large-scale waterway crossings in which a fluid filled pilot bore is drilled and then enlarged to the size required for the pipeline. Lubrication containing water and bentonite clay, referred to as drilling mud, would be used to aid the drilling and to coat the walls to maintain the opening. A wire line magnetic guidance system would be used to ensure that the angle, depth, and exit point abide by the detailed engineering plans. Once the hole is approximately 12 inches larger than the pipe, the pipeline is pulled through the drilled hole from the point of entry to the point of exit.

The workspace requirements for the HDDs extend to an area 200 feet wide and 200 feet long. Figure B-16 shows a diagram of a typical HDD work area. HDDs would be surface-to-surface; however, mud pits may need to be excavated.

Highways, Railroad, and Pipeline Crossings. In some cases, the proposed pipeline would be bored or drilled underneath interstate highways, freeways, under other pipelines and utilities, and under railroads. Placement of the pipeline bore with respect to other utilities would be in accordance with 49 CFR 195.250 that requires a minimum clearance of 12 inches from any underground structure. In cases where the crossing is bored, an entry and exit pit for the boring machine would be excavated using a backhoe on each side of the crossing; these pits would range in dimension from 25 to 30 feet long by 10 to 15 feet wide. If the crossings were made using HDD methods, the bore would be surface-to-surface, but mud pits may need to be excavated.

Figure B-10. Typical Slick Bore Work Area

Figure B-11. Typical Jack and Bore Work Area

Figure B-12. HDD, Typical Application

Figure B-13. HDD – First Pass

Figure B-14. HDD – Second Pass

Figure B-15. HDD – Third Pass

Figure B-16. Typical HDD Work Areas

B.5 Operation and Maintenance

B.5.1 System Operation

The proposed 20-inch pipeline and upgrades to Concord Station, as part of SFPP's existing pipeline system, would be operated from SFPP's Concord Station and monitored from the central control facility at the City of Orange Headquarters. Sacramento Station is operated from the central control facility at the City of Orange Headquarters. Approximately 25 people are currently employed at the Concord Station or work in the field carrying out routine inspection and maintenance as well as responding to possible system upset and/or failure emergencies on this portion of SFPP's pipeline system. Approximately 20 people are currently employed at the central facility and are responsible for system monitoring and/or operation 24 hours a day. No additional positions to SFPP's existing staff would be required as a result of this project.

The proposed pipeline would operate in the same manner as the existing SFPP pipeline. The various products are shipped in different sized batches according to each customers needs. The batches are pumped through the line without any batching pig or ball to separate the products. Once batches reach their destination they are separated and stored in tanks or are delivered directly or via stripping to their final destination. There is a certain amount of product commingling that occurs between dissimilar batches (e.g., diesel and gasoline). This product, called transmix, is returned to the customers via truck or pipeline.

B.5.2 System Control, Operation, and Safety Features

The computerized system of pipeline communications and system control is referred to as the Supervisory Control and Data Acquisition (SCADA) system. The function of SCADA is to send instructions to and receive data from Programmable Logic Controllers (PLCs) located at each facility and along the pipeline.

SFPP's safety system is partially based on SCADA, which gathers and analyzes data from many sources throughout the pipeline system. The pipeline system is equipped with various safety devices such as pressure sensing devices and electrical current and temperature measuring devices to assure reliable and safe operation of the pumps. The pipeline is protected by pressure control valves as well as pressure measuring devices and pressure relief valves. Operators and controllers use the SCADA system to automatically adjust the pressure and flow rate of the pipeline to provide for safe operation of the pipeline system. Pipeline data for the SCADA system will be transferred from each motor operated valve site to the control center via a dedicated telephone line.

Pipeline conditions are continuously monitored by the SCADA system that alerts operators to unusual pipeline conditions (high or low pressure, low flow). The system includes automatic high pressure shutdown of shipping pumps at the pump station. Operators at Concord Station and controllers at the City of Orange Headquarters can shut down the pipeline based on monitoring of operations. All alarms are recorded and logged at the control centers. The SCADA system has backup power from a diesel generator at the central control center in the City of Orange, backup power from an Uninterruptible Power Supply (UPS) at each of the critical stations and terminals, and a backup communications network.

In 1999, SFPP made enhancements to the SCADA system, including the use of a system-wide satellite communications, and frame-relay with backup routing capabilities. The data transmission was increased from four per minute to once every five seconds (resulting in higher data resolution and as a result, better leak detection performance). For this project, additional pressure and temperature transmitters would be located at motor operated valves along the pipeline and an additional ultrasonic meter would be installed at the Sacramento Station to further improve the leak detection system capability.

Leak Detection

Leak detection, including detection of small leaks, would be accomplished by a variety of methods including monitoring SCADA data; computational pipeline monitoring (CPM); monitoring "overs-and-shorts"; aerial/ground pipeline patrol; third party reports; internal inspection tools; external pipe inspection; and static pressure monitoring.

SFPP's core leak detection program for the 20-inch line would rely on monitoring and analysis of SCADA data, CPM using LeakWarn, and monitoring and analysis of overs-and-shorts to detect leaks of all sizes. Pipeline controllers are trained to monitor the SCADA data for abnormalities in pipeline operating conditions. The LeakWarn system would be used to detect abnormal pipeline operating parameters and develop trends that indicate possible leak conditions. Trends can develop in the overs-and-shorts (barrels in versus barrels out) that may indicate an abnormal operating condition.

The LeakWarn system would reside on a dedicated processor (with dedicated screen) at Concord Station and would poll the field data collection locations directly (not through a SCADA server or polling hub). Thus, the SCADA system and LeakWarn would be independent of each other. The LeakWarn polling cycle (request and response time combined) to all field locations would be 5 seconds. LeakWarn's refresh cycle (processing and output time combined) to the operator's screen is measured in milliseconds. Thus, for all practical purposes, the total time from field data collection to output to the operator would be five seconds.

Monitoring of static pipeline pressure when the line is shut down is used to facilitate leak detection. When a pipeline or pipeline section is shut down it is generally shut down with a certain level of pressure. Operators monitor such "shut in static pressure" for the detection of leaks. The pipeline is also inspected for leaks whenever it is exposed for regular maintenance, repair, or anomaly investigation.

A key element in preventing small leaks is SFPP's internal inspection program. Internal inspection instruments, also known as "smart pigs," are used to evaluate wall thickness of the pipe and the geometric shape of the pipe (dents, etc). The information from the pig runs is used to define areas of corrosion or other pipeline damage, which are inspected and repaired as necessary to prevent leaks from occurring. In addition, SFPP has a mill inspection program to ensure that fabricated pipe meets or exceeds the minimum applicable API specifications and complies with the company's specifications.

The method of detection and the time required to detect small leaks varies widely and cannot be accurately stated or estimated. However, methods of detecting and locating small leaks have improved in past years primarily because of increased public awareness (resulting in reporting of observed leaks), improved smart pig technology, and increased training of operating personnel. In addition, small leaks can be prevented with implementation of the following steps. First, improved pipe manufacture has resulted in longitudinal seam leaks being very rare. Second, the data from the new generation pipeline inspection pigs show areas of internal and external corrosion in the pipeline which can be used to analyze the pipeline using ASME B31 G criteria for repair/replacement or continued use of the pipeline. Third, operator training in observing and analyzing operating data has resulted in more readily determining situations that might be related to a small release.

Dig-Alert Protection

SFPP has a right-of-way protection program to prevent third party damage, which is a major contributor to pipeline leaks. Line flyers and line riders inspect the pipeline right-of-way on a regular basis to look for evidence of any kind or size of possible leak or any construction or excavation activities on or near the ROW that might cause an immediate leak or contribute to the possibility of a future leak because of damage to the pipe. SFPP has a comprehensive public awareness program utilizing various methods of communicating with persons along the route of the pipeline, emergency response personnel, governmental officials, as well as other members of the public. SFPP's pipelines are clearly marked and the markers include the emergency phone number. Marker posts along the rights-of-way comply with industry standards and governmental regulations. SFPP subscribes to the "one call" system that provides a single toll-free number for contractors and individuals to call before digging in the vicinity of the pipeline. Additionally, a warning tape with the pipeline name would be buried approximately 18 inches above the pipeline.

B.5.3 System Inspection and Maintenance

Inspections. The pipeline route would be visually inspected at least bi-weekly by line rider patrol in accordance with DOT requirements (49 CFR Part 195) to spot third-party construction or other factors that might threaten the integrity of the pipeline. Additionally, inspection of highway, utility, and pipeline crossing locations would be conducted in accordance with state and federal regulations. Pipe protection level would be inspected annually at all test locations, quarterly at control points and more than quarterly at cathodic protection systems to ensure corrosion control.

Pigging. Pigs or scrapers are devices inserted into the pipeline at launching points and retrieved at receiving points called scraper traps. Pigs are used to clean and/or inspect the pipeline.

"Smart" pigs are devices used to inspect and record the condition of the pipe. Smart pigs detect where corrosion or other damage has affected the wall thickness or shape. SFPP would perform a "baseline" smart pig run for the entire pipeline after the completion of construction. Once in operation, additional smart pig runs would be performed every five years in accordance with DOT regulations.

Hydrostatic Testing. As required by the DOT, system inspection and maintenance would include hydrostatic testing to check for pipeline leakage (see Section B.4.1.5).

Valves. Block valves are cycled and inspected twice annually, not to exceed seven months to ensure proper operation (per 49 CFR 195.420). Codes do not specify inspection requirements for check valves.

B.5.4 Emergency Response

An Oil Spill Response Plan (OSRP) prepared by SFPP has been approved by appropriate federal, state, and local agencies (including CA Department of Fish and Game, Office of Spill Prevention and Response) (SFPP, 1995). The OSRP is required under state and federal regulations (SB 2040 and 40 CFR 300, the Hazardous Substances Pollution Contingency Plan). The OSRP provides a finalized list of emergency service providers. SFPP has also prepared an Emergency Plan to specify measure to be taken in emergency scenarios. These documents identify the responsible parties for the incident command and the supporting organizations/agencies. Normally, the fire department commanders remain the incident commander until relieved by other authorities legally required to assume responsibility for the incident. In addition, the CSLC 24-hour emergency phone number would be included in the emergency response plan.

SFPP stations have fire fighting and other emergency equipment. Fire fighting equipment includes carbon dioxide and/or halon fire extinguishers inside the control rooms for electrical fires around panels and switchgear. Dry powder fire extinguishers are located in the station yard for hydrocarbon fires. Fire suppressant foaming agents (ATC concentrate) and related foam generation equipment is also onsite or readily available. Also, emergency call lists are posted at all stations, in case of accident, fire, or explosion.

The OSRP lists third-party contractors providing manpower and equipment such as vacuum trucks, boats, oil skimmers, absorbent and skirted booms, dump trucks, portable tanks, absorbent materials, dispersants, steam cleaners, hydroblasters, cranes, and forklifts. These would include contractors located in the Bay area. In addition, SFPP operations personnel are trained in the Incident Command System and oil spill containment and cleanup procedures. Local emergency response providers would be notified to assist in traffic control, evacuations of homes or businesses, crowd control, ambulance and hospital services, and backup fire protection services.

B.6 Useful Life of Proposed Pipeline

The expected operational life of the pipeline is about 50 years and is normally dictated by economic obsolescence. When the Proposed Project reaches the end of its useful life, it would be abandoned in accordance with appropriate local, state, and federal regulations enforced at the time of taking the pipeline out of petroleum service. These procedures would likely be similar to those proposed for the decommissioning of the existing 14-inch pipeline (see Section B.3.4).

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Figure B-2. Detail of Proposed Pipeline Route